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EXAMINER	
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2661	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/643,210	HEIL, TOM	
	Examiner	Art Unit	
	Joshua Kading	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-10 and 16-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-10 and 16-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Objections

Claim 7 is objected to because of the following informalities:

Claim 7 states "the corresponding one of the storage device" in lines 6-7 and 7-8. It is not completely clear if applicant intends this to make reference to "a one of the storage devices" previously disclosed, it is assumed this is the case since there is no previous disclosure of a single storage device. However, it is recommended that applicant change "the corresponding one of the storage device" to --the corresponding one of the storage devices-- for clarity.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-10, 19, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6, lines 11 and 15; claim 17, line 9; and claim 10, lines 4 and 7 applicant discloses "the switch matrix". Since applicant discloses "a switch matrix" and "a second switch matrix" in claim 1, it is not clear which switch matrix applicant is referring to.

In claim 6, lines 15-16 and 16-17; and claim 7, line 9 applicant further discloses "the communication channels". However, applicant discloses "communication channels" and "second communication channels" in independent claim 1. It is therefore, unclear which set of communication channels applicant is referring to in claims 6 and 7.

In claim 7, line 2; and claim 9, line 4 applicant discloses "the plurality of storage-side links" or "the storage-side links". It is not clear which storage-side links applicant is referring to, since independent claim 1 discloses "a plurality of storage-side links" and "a plurality of second storage-side links".

In claim 7, line 12 applicant discloses "the same stored data". There is a lack of antecedent basis for this limitation as there is not mention previously of any stored data. Is "the same stored data" the same as the "message packets" sent to the storage device? Or is there other data that is stored?

In claim 19, lines 3 and 6 applicant discloses "a second data access request", "the second data access request" and "a second one of the data transfer paths" on line 11. Since applicant already disclosed "a second data access request" and "a second

one of the data transfer paths" in independent claim 16, it is unclear if the "second data access request" or "second one of the data transfer paths" of claim 19 is a different access request/data path or if it is the same as the one in claim 16. Further it is not clear if the reference on line 6 to "the second data access request" is referring to the one mentioned in claim 19 or the one in claim 16 (if they are different).

In claim 19, lines 6-7 and 12-13; and claim 20, lines 9-10, 13-14, and 18-19 applicant discloses "a second selected one of the plurality of storage devices" and "the second selected storage device". Since applicant already disclosed "a second selected one of the plurality of storage devices" in independent claim 16, it is unclear if the "selected one of the plurality of storage devices" of claim 19 is a different storage device or if it is the same as the one in claim 16. Further it is not clear if the reference in claim 19 on lines 12-13 and claim 20 to "the second selected storage device" is referring to the one mentioned in claim 19 or the one in claim 16 (if they are different).

Lastly, in claim 19, line 11 applicant discloses "a second one of the data transfer paths". Since applicant already disclosed "a second one of the data transfer paths" in independent claim 16, it is unclear if "a second one of the data transfer paths" of claim 19 is a different transfer path or if it is the same as the one in claim 16.

The term "comparable" in claim 9, line 8 is a relative term which renders the claim indefinite. The term "comparable" is not defined by the claim, the specification

does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is not clear what applicant means by having the storage-side link's bandwidth comparable to the host-side link's bandwidth. Firstly, where in the specification does applicant define a comparable bandwidth between the host-side and storage-side links? What are the bounds for comparable? Can the storage-side link's bandwidth by larger than the host-side's and still remain comparable? When does the bandwidth gap become large enough to identify the different links as non-comparable?

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4, 6, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson (U.S. Patent 6,029,062) in view of Opher et al. (U.S. Patent 5,345,558).

Regarding claim 1, Hanson discloses "a storage network having a host device operative to access stored data, a plurality of storage devices operative to store the stored data and a switched fabric connecting the host device and the plurality of storage devices to communicate data access requests and transfer data between the host device and the storage devices, the switched fabric comprising:

a host-side link connected to the host device and including a host-side interface connected to the host device, the host-side interface sending and receiving data to and from the host device (figures 1 and 3, where elements 24 can be considered the hosts and element 24 and the lines connecting them indicate a host-side interface through which data can travel);

a plurality of storage-side links connected to the plurality of storage devices and each of the storage-side links including a storage-side interface connected to a corresponding one of the storage devices, the storage-side interface sending and receiving data to and from the corresponding storage device (figure 3, elements 116 represent the storage devices which are connected through physical links or interfaces);

and a switch matrix connected to the host-side link and the storage-side links (figure 3, element 104) and operative to establish communication channels between the host-side link and any of the storage-side links for transferring message packets including the data between the host device and any of the storage devices (figure 3, where it is suggested that the switch matrix, as is known in the art, will establish communication links (channels) between the host and the storage devices), the switch matrix not establishing communication channels between the storage-side links (figure 3 as can be seen there are no links between the storage-side links, only to and from the host device);

a second host-side link integrated in the second switch and connected to the host device and including a second host-side interface connected to the host device (figures 1 and 3, elements 28 are again host devices connected to the storage devices via links

as shown in the figures), wherein the second host-side interface sends and receives data to and from the host device the second host-side link being in addition to the host-side link first aforesaid integrated in the first switch and the second host-side interface being in addition to the host-side interface first aforesaid included in the first host-side link (figures 1 and 3 where it is implied by the figures that the host devices will be sending and receiving data from the storage devices);

a plurality of second storage-side links integrated in the second switch and connected to the plurality of storage devices and each including a second storage-side interface to the storage devices (figure 3, elements 116 show a plurality of storage devices each connected via its own interface (link) as shown), wherein the second storage-side interfaces send and receive data to and from the storage devices, the second storage-side links being in addition to the storage-side links first aforesaid integrated in the first switch and the second storage-side interfaces being in addition to the storage-side interfaces first aforesaid included in the first storage-side links (figure 3 as with the host-side links, the storage-side links are taken to send and receive data)...

a second switch matrix integrated in the second switch and connected to the second host-side link and the second storage-side links and operative to establish second communication channels between the second host-side link and any of the second storage-side links for transferring the message packets including the data between the host device and any of the storage devices (figure 3, elements 104 show a plurality of switch matrices each of which contain switches), the second switch matrix not establishing communication channels between the second storage-side links (figure

3 as can be seen there are no links between the storage-side links, only to and from the host device), the second switch matrix being in addition to the switch matrix first aforesaid integrated in the first switch and the second communication channels being in addition to the communication channels first aforesaid established by the first switch matrix (figure 3, elements 104 where one of the switch matrices is the first switch matrix and one of them is the second switch matrix, each establishing their own communication channels to the appropriate storage device); and

wherein the host device is operative to access the stored data through the switched fabric through either of the first or second switches to the storage devices (figure 3, where it is indicated through the use of drawn physical connections that each host device can access the data stored in the storage devices through any of the switch matrices 104)."

However, Hanson lacks "the switched fabric further comprising: a switch connected to the host device and the storage devices, wherein the host-side link the plurality of storage-side links and the switch matrix are integrated in the switch in a single integrated circuit (figure 8A shows the contents of switch fabric and where element 806 is a switch that is connected to the host device by connections 0 and 1 and connected to the storage devices through the outputs of stage 4 switches; further, Opher does not explicitly say that "the host-side link, the plurality of storage-side links and the switch matrix are integrated in the switch in a single integrated circuit" however, Opher does not need to explicitly say this as integrating these items on an IC is a design choice and the components that would be integrated onto the IC are still taught

by Hanson and Opher); a second switch in addition to the switch first aforesaid, connected to the host device and the storage devices (figure 8A, where any of the elements 806 represent a switch of a switch matrix in the switched fabric 202)..."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the first and second switches with the rest of the apparatus for the commonly known purpose of routing data from the host to the storage device and vice versa. The motivation for having the switch perform this function is so that the data is correctly and efficiently routed to its appropriate destination.

Regarding claim 4, Hanson and Opher disclose the switched fabric of claim 1. However, Opher lacks what Hanson further discloses, "the first and second switches form redundant data transfer paths between the host device and the storage devices (figure 3, as can be seen by the physical connections drawn in the figure, each path is redundant because each can take data to the hosts from the storage devices and vice versa through several different paths)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the redundant paths with the switched fabric of claim 1 for the same reasons and motivation as in claim 1.

Since applicant is not clear on which switch matrix "the switch matrix" and which set of communication channels "the communication channels" is referring to, it is believed that either the first or second matrix or communication channels will be sufficient for these limitations as both the first and second matrices and communication

channels perform the same function and communicate data between the same hosts and storage devices.

Regarding claim 6, Hanson and Opher disclose the switched fabric of claim 1. However, Opher lacks what Hanson further discloses, "a second host device in addition to the host device first aforesaid, connected to the switched fabric (figure 3, elements 28 where all of the switch matrices of element 50 constitute a switched fabric); and wherein the switched fabric further comprises a second host-side link, in addition to the host-side link first aforesaid (figure 3 where both hosts are clearly linked by physical interfaces to the switched fabric); the second host-side link connects to the second host device and includes a second host-side interface, in addition to the host-side interface first aforesaid, connected to the second host device (figure 3, the physical connection line drawn is the second host-side interface); the second host-side interface sends and receives the data to and from the second host device (figure 3, as with the first host, it is implied that the system of figure 3 sends and transmits data to and from the host devices); and the switch matrix also connects to the second host-side link and is further operative to establish the communication channels between the second host-side link and any of the storage-side links for transferring the message packets including the data between the second host device and any of the storage devices (figure 3 where any of the elements 104 are attached to the host devices for transferring messages (data) to and from); the switch matrix is further operative to establish a first one of the communication channels between the first host-side link and a first one of the storage-side links and a second one of the communication channels between the

second host-side link and a second one of the storage-side links for simultaneous transfer of data between the first and second host devices and the storage devices connected to the first and second ones of the storage-side links, respectively (figure 3, where it is not necessarily explicitly disclosed that each host can simultaneously transmit and receive data, it is implied; since each host 28 is independent in operation of the other, there is no reason why each host could not send and receive its respective data while the other is sending and receiving data, if it were the case that only one host could send and receive data there would be no need for two hosts since only one could operate at any one time, thus by having a plurality of hosts, it is implied that they can operate simultaneously)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the second host and simultaneous communication with the switched fabric of claim 1 for the same reasons and motivation as in claim 1.

Since it is not clear which storage-side links applicant is referring to with "the plurality of storage-side links" it is assumed that either the first, second, or both sets will suffice.

Regarding claim 7, Hanson and Opher disclose the switched fabric of claim 1. However, Opher lacks what Hanson further discloses, "the plurality of storage-side links include a plurality of first storage-side links and a plurality of second storage-side links (figure 3, where the physical links from the storage devices 116 and the physical links from the switch matrices 104 constitute storage-side links); each of the first storage-side

links corresponds to one of the second storage-side links and to one of the storage devices (figure 3 where each storage-side link from the switch matrices can correspond to any of the other storage-side links as they are all capable of communicating data to and from the same host); each of the first storage-side links connects to the corresponding storage device, and the corresponding second storage-side link also connects to the corresponding storage device (figure 3 where each storage-side link from the switch matrices can access either storage device through element 114); the switch matrix establishes the communication channels for transferring the message packets between the host device and any of the storage devices through either the first or second storage-side links (figure 3, where the switch matrices are known to establish the communication channels between the host and the storage device); and the host device is operative to access the same stored data through the switched fabric through either the first or the second storage-side links to the storage devices (figure 3, where it is indicated through the use of drawn physical connections that each host device can access the data stored in the storage devices through any of the switch matrices 104)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the further described storage-side links with the switched fabric of claim 1 for the same reasons and motivation as in claim 1.

Regarding claim 8, Hanson and Opher disclose the switched fabric of claim 7. However, Opher lacks what Hanson further discloses, "each first storage-side link and the corresponding second storage-side link form redundant data transfer paths between

the switched fabric and the corresponding storage device (figure 3, as can be seen by the physical connections drawn in the figure, each path is redundant because each can take data to the hosts from the storage devices and vice versa through several different paths)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the redundant paths with the switched fabric of claim 1 for the same reasons and motivation as in claim 1.

Claims 16 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel et al. (U.S. Patent 5,774,660) in view of Opher et al. (U.S. Patent 5,345,558).

In regard to claim 16, Brendel et al. disclose "a method of communicating data between a host device and a plurality of storage devices through a switched fabric comprising the steps of:

sending a data access request from the host device to the switched fabric (col. 2, lines 18-24 where the system of figure 1 works similarly to the system of figure 4 except that the data access requests and data are sent through switch 32 as can be read in col. 42-47);

directing the data access request to a selected one of the plurality of storage devices connected to the switched fabric (col. 4, lines 51-54 where the act of choosing the server is the equivalent of selecting a storage device);

sending the data access request from the switched fabric to the selected storage device (col. 4, lines 51-54 where it is implied that the server will be notified that it has been selected to communicate with the host); and

transferring data between the host device and the selected storage device in response to the data access request through the established data transfer path in the switched fabric between the host device and the selected storage device (col. 4, lines 59-64)."

However, Brendel lacks "establishing data transfer paths through the switched fabric from the host device to any of the storage devices and not between the storage devices; establishing one of the data transfer paths between the host device and the selected storage device through the switched fabric."

Opher however, discloses "establishing data transfer paths through the switched fabric from the host device to any of the storage devices and not between the storage devices (figure 8A where it is clear from the paths between stages that there are several data transfer paths through the switched fabric 202 from the host device at one end to the storage devices at the other); establishing one of the data transfer paths between the host device and the selected storage device through the switched fabric (figure 8A where the darkened path from input port 5 to output port 13 constitutes a single data transfer path setup between a the host device and the selected storage device)."

Brendel and Opher further explicitly lack "sending a second data access request, in addition to the data access request first aforesaid, from the host device to the switched fabric; directing the second data access request to a second selected one of

the plurality of storage devices; establishing a second one of the data transfer paths between the host device and the second selected storage device through the switched fabric; sending the second data access request from the switched fabric to the second selected storage device; transferring second data between the host device and the second selected storage device in response to the second data access request through the second established data transfer path by transferring the second data between the switched fabric and the second selected storage device and transferring the second data between the switched fabric and the host device; and transferring the data first aforesaid between the switched fabric and the first selected storage device at the same time as transferring the second data between the switched fabric and the second selected storage device."

Although Brendel and Opher do not explicitly disclose a second access request and the consequences of that request, Brendel and Opher do disclose sending an access request as disclosed previously in this rejection. It would have been obvious to one with ordinary skill in the art at the time of invention to include the second access request and the results of that access request with the first access request because as seen in figure 4 of Brendel there are two hosts (client browsers). Since each client browser operates independently of the other, they each must be capable of sending access requests to element 32 for further routing to the appropriate storage device. Thus, it is completely plausible that one host sends a first access request and the other host sends a second access request. Further, since both hosts operate independently of each other, their respective requests will be handled simultaneously. If it were the

case that only one request could be handled at a time, the system would be overloaded with requests and fail as there are many more hosts in the "real world" than the disclosed two. Therefore, each request can be handled simultaneously.

It would have been obvious to one with ordinary skill in the art at the time of invention to include the data transfer paths and simultaneous processing with the rest of the method for the commonly known purpose of routing data from the host to the storage device and vice versa. The motivation for having the switch perform this function is so that the data is correctly and efficiently routed to its appropriate destination.

Regarding claim 18, Brendel and Opher disclose the method of claim 16. However, Brendel lacks what Opher further discloses, "sending the first data access request from the host device to a first switch (figure 8A, where any of the switches in stage 801 can act as a first switch for the first data access request), the first switch comprising a first portion of the switched fabric, each of the storage devices being connected to the first switch (figure 8A, where the entire device 202 is a switched fabric and the storage devices are connected through the outputs)...sending the first data access request from the first switch to the first selected storage device (figure 8A, as seen through the darkened path 807, the input from the host device travels the switch and is sent to the storage device connected to the outputs)... establishing the data transfer path first aforesaid between the host device and the first selected storage device through the first switch (again in figure 8A, the data transfer path is established

by the darkened path 807)...transferring the first data between the host device and the first selected storage device in response to the first data access request through the first established data transfer path through the first switch (although it is not explicitly stated by figure 8A, the path 807 is used to transmit data to and from the host and the appropriate storage device)..."

Brendel and Opher however, both explicitly lack "sending the second data access request from the host device to a second switch, the second switch comprising a second portion of the switched fabric, each of the storage devices also being connected to the second switch; establishing the second data transfer path between the host device and the second selected storage device through the second switch; sending the second data access request from the second switch to the second selected storage device; and transferring the second data between the host device and the second selected storage device in response to the second data access request through the second established data transfer path through the second switch at the same time as transferring the first data between the host device and the first selected storage device."

As with parent claim 16, Brendel and Opher do disclose sending a first access request as disclosed previously in the rejection. It would have been obvious to one with ordinary skill in the art at the time of invention to include the second access request and the results of that access request with the first access request because as seen in figure 4 of Brendel there are two hosts (client browsers). Since each client browser operates independently of the other, they each must be capable of sending access requests to element 32 for further routing to the appropriate storage device. Thus, it is completely

plausible that one host sends a first access request and the other host sends a second access request. Further, since both hosts operate independently of each other, their respective requests will be handled at the same time. If it were the case that only one request could be handled at a time, the system would be overloaded with requests and fail as there are many more hosts in the "real world" than the disclosed two. Therefore, each request can be handled at the same time.

It would have been obvious to one with ordinary skill in the art at the time of invention to include the further explanation of the sending of access requests with the method of claim 16 for the same reasons and motivation as in claim 16.

Since it is not clear if the "second data access request" and "the second one of the data transfer paths" are the same as the ones disclosed in claim 16, it is assumed that they are.

Regarding claim 19, Brendel and Opher disclose the method of claim 16. However, Brendel lacks what Opher further discloses, "sending a...data access request, in addition to the data access request first aforesaid, from a second host device, in addition to the host device first aforesaid, to the switched fabric (col. 2, lines 18-24 where the system of figure 1 works similarly to the system of figure 4 except that the data access requests and data are sent through switch 32 as can be read in col. 42-47); directing the...data access request to a second selected one of the plurality of storage devices, in addition to the selected storage device first aforesaid (col. 4, lines 51-54 where the act of choosing the server is the equivalent of selecting a storage device and

where it is implied that the server will be notified that it has been selected to communicate with the host); sending the...data access request from the switched fabric to the second selected storage device (col. 2, lines 18-24 where the system of figure 1 works similarly to the system of figure 4 except that the data access requests and data are sent through switch 32 as can be read in col. 42-47); transferring second data between the second host device and the second selected storage device in response to the...data access request through the second established data transfer path in the switched fabric (col. 4, lines 59-64)..."

However, Brendel lacks what Opher discloses, "establishing the data transfer paths through the switched fabric from either of the first and second host devices to any of the storage devices and not between the storage devices (figure 8A where it is clear from the paths between stages that there are several data transfer paths through the switched fabric 202 from the host device at one end to the storage devices at the other); establishing a second one of the data transfer paths, in addition to the established data transfer path first aforesaid, between the second host device and the second selected storage device through the switched fabric (figure 8A where it is clear from the paths between stages that there are several data transfer paths through the switched fabric 202 from the host device at one end to the storage devices at the other; where if one path can be established so can a second path)..."

Brendel and Opher however, both explicitly lack "a second access request" and "transferring the data first aforesaid between the first host device and the first selected storage device in response to the first data access request through the first established

data transfer path in the switched fabric at the same time as transferring the second data between the second host device and the second selected storage device."

As with parent claim 16, Brendel and Opher do disclose sending a first access request as disclosed previously in the rejection. It would have been obvious to one with ordinary skill in the art at the time of invention to include the second access request and the results of that access request with the first access request because as seen in figure 4 of Brendel there are two hosts (client browsers). Since each client browser operates independently of the other, they each must be capable of sending access requests to element 32 for further routing to the appropriate storage device. Thus, it is completely plausible that one host sends a first access request and the other host sends a second access request. Further, since both hosts operate independently of each other, their respective requests will be handled at the same time. If it were the case that only one request could be handled at a time, the system would be overloaded with requests and fail, as there are many more hosts in the "real world" than the disclosed two. Therefore, each request can be handled at the same time.

It would have been obvious to one with ordinary skill in the art at the time of invention to include the further explanation of the sending of access requests with the method of claim 16 for the same reasons and motivation as in claim 16.

Regarding claim 20, Brendel and Opher disclose the method of claim 19. However, Brendel lacks what Opher discloses, "sending the first data access request from the host device to a first one of at least two switches (figure 8A, where any of the

switches in stage 801 can act as a first switch for the first data access request), the at least two switches comprising the switched fabric and being connected to each of the storage devices (figure 8A, where the entire device 202 is a switched fabric and the storage devices are connected through the outputs)...sending the first data access request from the first switch to the first selected storage device (figure 8A, as seen through the darkened path 807, the input from the host device travels the switch and is sent to the storage device connected to the outputs)... establishing the first data transfer path between the first host device and the first selected storage device through the first switch (again in figure 8A, the data transfer path is established by the darkened path 807)...transferring the first data between the first host device and the first selected storage device in response to the first data access request through the first established data transfer path through the first switch (although it is not explicitly stated by figure 8A, the path 807 is used to transmit data to and from the host and the appropriate storage device)..."

Brendel and Opher however, both explicitly lack "sending the second data access request from the second host device to a second one of the at least two switches; establishing the second data transfer path between the second host device and the second selected storage device through the second switch; sending the second data access request from the second switch to the second selected storage device; and transferring the second data between the host device and the second selected storage device in response to the second data access request through the second established

data transfer path through the second switch at the same time as transferring the first data between the host device and the first selected storage device."

As with parent claim 16, Brendel and Opher do disclose sending a first access request as disclosed previously in the rejection. It would have been obvious to one with ordinary skill in the art at the time of invention to include the second access request and the results of that access request with the first access request because as seen in figure 4 of Brendel there are two hosts (client browsers). Since each client browser operates independently of the other, they each must be capable of sending access requests to element 32 for further routing to the appropriate storage device. Thus, it is completely plausible that one host sends a first access request and the other host sends a second access request. Further, since both hosts operate independently of each other, their respective requests will be handled at the same time. If it were the case that only one request could be handled at a time, the system would be overloaded with requests and fail, as there are many more hosts in the "real world" than the disclosed two. Therefore, each request can be handled at the same time.

It would have been obvious to one with ordinary skill in the art at the time of invention to include the further explanation of the sending of access requests with the method of claim 19 for the same reasons and motivation as in claim 19.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel et al. and Opher et al. as applied to claim 16 above, and further in view of Bohm et al. (U.S. Patent 5,982,780).

Regarding claim 21, Brendel and Opher disclose the method of claim 16. However, Brendel and Opher lack what Bohm discloses, "monitoring the host device, the switched fabric and the storage devices to detect for a capacity saturation condition (col. 7, lines 23-25 where it is not explicitly disclosed that the host device, the switched fabric or the storage devices are monitored for saturation conditions, but it is known in the art that these devices in a network are monitored for potential problems, if they weren't monitored for problems the network would not run smoothly and could even possibly fail due to unresolved problems); modifying the host device upon detecting a host device saturation condition (col. 7, lines 23-25 although the device being modified (adding more nodes) is the switched fabric, it is well known in the art that to increase the capacity because of capacity saturation, more devices of any kind can be added thus modifying the original device by alleviating the saturation); modifying the switched fabric upon detecting a switched fabric saturation condition (col. 7, lines 23-25 where the act of adding more switch nodes is modifying the switched fabric); and modifying the storage devices upon detecting a storage device saturation condition (col. 7, lines 23-25 although the device being modified (adding more nodes) is the switched fabric, it is well known in the art that to increase the capacity because of capacity saturation, more devices of any kind can be added thus modifying the original device by alleviating the saturation)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the monitoring for saturation conditions and modifying because of saturation conditions for the purpose of alleviating congestion of the network and

increasing the network capacity. The motivation for increasing the capacity is simply to allow the network to accommodate more traffic.

It is assumed "the storage-side links" can refer to any of the previous disclosed storage-side links equally, thus they are treated as such. Also, the term "comparable" is taken to mean the same as.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson and Opher et al. as applied to claim 1 above, and further in view of Chong, Jr. (U.S. Patent 6,370,605 B1).

Regarding claim 9, Hanson and Opher disclose the switched fabric of claim 1. However, Hanson and Opher lack what Chong discloses, "the host-side link transfers and receives data to and from the host device at a first data transfer rate (figure 3C, where the links between the host computer 12 and switch 22 have a data transfer rate of 3X MB/sec); the storage-side links transfer and receive data to and from the storage devices at a second data transfer rate lesser than the first data transfer rate (figure 3C shows the data transfer rate to the storage device 18 as 3X MB/sec but does not show a plurality of storage devices nor a lesser storage-link bandwidth, however, figure 8 shows two storage devices 18A and 18B and one host side link; as for the links bandwidths there is no reason to doubt that the total bandwidth of the host side link would be smaller than the combined bandwidths of the individual storage links in figure 8 because the individual storage links are inherently less than the host side link as they are divided from the host side link's bandwidth and must add to the divided bandwidth);

the first data transfer rate defines a host-side bandwidth for the host-side link (figures 3C and 8 show the host device's link bandwidth); and the second data transfer rate for all of the storage-side links combined defines a combined bandwidth for the storage-side links comparable to the host-side bandwidth (figure 3C shows that the total storage side link bandwidth is "comparable" to the host side link bandwidth in that they are the same)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the different transfer rate for the storage links than the host link rate with the switched fabric of claim 1 for the purpose of allowing more than one storage device to communicate with the host device. The motivation for having more than one storage device is so that more data can be stored or so that the system may have backup storage device in case of failure of the other storage device.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson, Opher et al., and Chong et al. as applied to claim 9 above, and further in view of Maezawa et al. (U.S. Patent 6,145,024).

Regarding claim 10, Hanson, Opher, and Chong disclose the switched fabric of claim 9. However, Hanson, Opher, and Chong lack what Maezawa discloses, "the host-side and storage-side interfaces each include a serializer/deserializer (figure 1, elements 1 and 10 show a host and a memory unit (storage device) with a "multiplexer channel" thus implying that the host-side and storage-side use a multiplexer, and logically a demultiplexer); each serializer/deserializer serializes parallel data into serial

data transferred from the switch matrix through the respective link to the respective host device or storage device (figure 1, elements 1 and 10 which imply the multiplexer which is functionally equivalent to a serializer in that both take individual data packets acting in parallel and combine them into a single serial data stream); each serializer/deserializer deserializes serial data into parallel data transferred from the respective host device or storage device through the respective link to the switch matrix (figure 1, elements 1 and 10 again show the multiplexer channel that suggest the presence of a multiplexer and if data is multiplexed at the host or the storage device, returning data must be demultiplexed (deserialized) at each end so the data may be then used by the host or storage device); and each serializer/deserializer operates at the data transfer rate for its link (this is an obvious expedient since, as described in Chong, each side has their appropriate data transfer rates within which they operate)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the serialzer/deserializer with the switched fabric of claim 9 for the purpose of accommodating larger capacity data transfers (Maezawa, col. 8, lines 24-27). The motivation for transferring larger data capacities is so that more data can be transferred in a shorter amount of time than if it were transferred non-serially.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brendel et a. and Opher et al. as applied to claim 16 above, and further in view of Chong, Jr. (U.S. Patent 6,370,605 B1).

Regarding claim 17, Brendel and Opher disclose the method of claim 16. However, Brendel and Opher lack what Chong discloses, "transferring the first and the second data between the switched fabric and the first and the second selected storage devices, respectively, at a storage-side transfer speed (figures 3C and 8, where figure 3C shows the data transfer rates for the host-side and the storage-side and figure 8 shows the plurality of storage devices 18A and 18B that correspond to the storage device 18 of figure 3C, thus the first and second data is transferred between the host, thus switched fabric, and the first and second storage devices); and transferring the first and second data between the switched fabric and the host device at a host-side transfer speed that is at least twice the storage-side transfer speed (figure 3C shows that the entire host-side link data rate is 3X MB/sec as is the entire storage-side link data rate, however, if the storage device 18 is to have a communication rate that is the same as the host-side link then each storage device 18A and 18 B must be half that of the total storage-side link rate, i.e. the host-side is twice the storage-side links rate per link)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the twice the storage-side link rate with the method of claim 16 for the purpose of allowing more than one storage device to communicate with the host device. The motivation for having more than one storage device is so that more data can be stored or so that the system may have backup storage device in case of failure of the other storage device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Kading whose telephone number is (703) 305-0342. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Olms can be reached on (703) 305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Joshua Kading
Examiner
Art Unit 2661

July 15, 2004

KENNETH VANDERPUYE
PRIMARY EXAMINER